

What is Claimed is:

1. A wire loop comprising:

5 a wire connecting a first bonding point and a second bonding point therethrough;

said wire including a ball bonded to said first bonding point, a neck portion adjacent to said ball and a major portion extending from said neck portion to said second bonding point;

10 wherein said major portion of said wire has a crushed part formed in proximity to said neck portion by crushing the part of said wire together with a top portion of said ball.

15 2. The wire loop as defined in claim 1, wherein said neck portion includes a first kink formed by a part of said neck portion being doubled over.

20 3. The wire loop as defined in claim 1, wherein said major portion of said wire includes a horizontal portion extending in a substantially horizontal direction from said neck portion and an inclined portion which extends from said horizontal portion to said second bonding point and which has an end thereof bonded to said second bonding point; and

25 said inclined portion is connected to said horizontal portion through a second kink formed in a part of said wire therebetween.

30 4. The wire loop as defined in claim 2, wherein said major portion of said wire includes a horizontal portion extending in a substantially horizontal direction from said neck portion and an inclined portion which extends from said horizontal portion to said second bonding point and which has an end thereof bonded to said second bonding point; and

said inclined portion is connected to said horizontal

portion through a second kink formed in a part of said wire therebetween.

5 5. The wire loop as defined in claim 2, wherein said neck portion includes at least one additional doubled over kink like said first kink.

10 6. A wire bonding method for bonding a wire between a first bonding point and a second bonding point using a capillary, comprising the steps of:

 (a) bonding a ball formed on a tip end of the wire to said first bonding point;

15 (b) moving said capillary horizontally and vertically while carrying out loop control, to thereby form a kink in a neck portion of the wire adjacent to said ball;

 (c) bonding the wire to a top or the vicinity of the top of said ball bonded to said first bonding point; and

20 (d) thereafter, moving said capillary horizontally and vertically to said second bonding point while delivering the wire from said capillary and carrying out loop control, and then bonding the wire to said second bonding point;

25 wherein the step includes crushing a part of the wire and the top of said ball with said capillary to form a crushed part in the wire.

 7. The wire bonding method as defined in claim 6, wherein in the steps (b) and (c), said neck portion of the wire is doubled over to form said kink.

30 8. The wire bonding method as defined in claim 6, wherein the steps (b) and (c) are repeatedly carried out a plurality of times to form at least one additional doubled over kink in said neck portion.

9. The wire bonding method as defined in claim 7, wherein the steps (b) and (c) are repeatedly carried out a plurality of times to form at least one additional doubled over kink in said neck portion.

5

10. The wire bonding method as defined in claim 6, wherein the step (d) includes operating said capillary to form an additional kink in a portion of the wire located between said crushed part and said second bonding point.

10

11. The wire bonding method as defined in claim 7, wherein the step (d) includes operating said capillary to form an additional kink in a portion of the wire located between said crushed part and said second bonding point.

15

12. The wire bonding method as defined in claim 8, wherein the step (d) includes operating said capillary to form an additional kink in a portion of the wire located between said crushed part and said second bonding point.

20

13. A wire bonding apparatus for carrying out a wire bonding method of claim 6, comprising:

a capillary having the wire inserted therethrough to deliver the wire from said capillary;

25

a clamp for releasably clamping the wire;

a moving means for moving said capillary horizontally and vertically;

a control unit for controlling the movement of said capillary; and

30

a means for manually inputting height of said capillary to be raised into said control unit, whereby the movement of said capillary is automatically controlled.

14. A semiconductor device comprising:

a first bonding point;

a second bonding point; and

a wire bonded to said first bonding point and said
second bonding point to connect said first bonding point and
5 said second bonding point therethrough;

wherein said wire includes a ball bonded to said first
bonding point, a neck portion adjacent to said ball and a
major portion extending from said neck portion to said second
bonding point; and

10 wherein said major portion of said wire has a crushed
part formed in proximity to said neck portion by crushing the
part of said wire together with a top portion of said ball.

15 15. The semiconductor device as defined in claim 14,
wherein said neck portion includes a first kink formed by a
part of said neck portion being doubled over.

20 16. The semiconductor device as defined in claim 15,
wherein said neck portion includes at least one additional
doubled over kink like said first kink.